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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/731,177

12/09/2003

J. Christopher Matayabas JR.

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12/14/2005

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EXAMINER

GEYER, SCOTT B

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/731,177

Applicant(s)

MATAYABAS ET AL.

Examiner

Scott Geyer

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 20-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28-37 is/are allowed.
- 6) ☒ Claim(s) 20-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The applicant's amendment to claim 28 is acceptable; accordingly, the rejection of claims 28-37 is withdrawn.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 20, 21, 23 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Featherby et al. (6,368,899 B1).

As to **claims 20, 21, 23 and 27**, Featherby et al. teach a die (i.e. an integrated circuit) 16 connected to a substrate 32 with wires. The wires and the die are encapsulated by an electrically insulating material 300, as seen in figure 3. A thermally conductive material 12 encapsulates the die, the wires and the electrically insulating material as shown in figure 5. The thermally conductive material is in contact with the entire part of the surface of the electrically insulating material that is not in contact with the substrate, die or wires. The encapsulants are applied to the wires and the die by dispensing.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2812

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Featherby et al. (6,368,899 B1) as applied to claim 21 and 23 above, and further in view of Schmidt et al. (4,843,036).

As to **claims 22 and 24**, Featherby et al. teach all of the limitations as noted above for claims 21 and 23, except for curing of the encapsulant. However, Schmidt et al. teach UV curing of an encapsulant as shown in figure 4. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the method of Featherby et al. with UV curing of an encapsulant as taught by Schmidt et al. so as to quickly and economically cure the encapsulant.

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Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Featherby et al. (6,368,899 B1) as applied to claim 20 above, and further in view of Lebonheur et al. (6,617,683).

As to **claims 25 and 26**, Featherby et al. teach all of the limitations as noted above for claim 20, except for the thermally conductive material comprising a curable resin, a cross-linker, a catalyst and a metal filler. However, Lebonheur et al. teach a thermally conductive material comprising a curable resin, a cross-linking agent, a catalyst, a metal filler such as aluminum or silver (see column 3, lines 23-67, et seq.). Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the method of Featherby et al. with a thermally

conductive material as taught by Lebonheur et al. so as to form a stable material capable of dissipating heat from the integrated circuit device.

***Allowable Subject Matter***

Claims 28-37 are allowed.

The following is a statement of reasons for the indication of allowable subject matter. The prior art of record and to the examiner's knowledge does not teach or render obvious, at least to the skilled artisan, the instant invention regarding a method of making a semiconductor device, particularly characterized by providing a stack of dies, encapsulating the wires and a portion of the stack of dies in an electrically insulating material, and then encapsulating the stack of dies, the wires and the electrically insulating material in a thermally conductive material, as recited in independent claim 28. Claims 29-37 are dependent upon claim 28.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2812

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Geyer whose telephone number is (571) 272-1958. The examiner can normally be reached on weekdays, between 10:00am - 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 12/7/05

Scott Geyer  
December 7, 2005